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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,399	12/03/2003	David Forehand	MEM 2657001	5565
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CARR LLP 670 FOUNDERS SQUARE 900 JACKSON STREET DALLAS, TX 75202			EXAMINER MITCHELL, JAMES M	
			ART UNIT 2813	PAPER NUMBER
			MAIL DATE 05/08/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/726,399	Applicant(s) FOREHAND, DAVID	
	Examiner James M. Mitchell	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 February 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-69 is/are pending in the application.
- 4a) Of the above claim(s) 12-23, 34-43, 53-63, 65 and 67 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12, 24-33, 44-53, 64, 66, 68 and 69 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. This office action is in response to the amendment filed February 12, 2007.

#### ***Claim Rejections - 35 USC § 112***

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-12, 24-33, 44-53, 64 and 66-69 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The disclosure of two species, a MEMS and Micromachined device<sup>1</sup>, is not sufficient to constitute the genus of the claimed "microscopic device."<sup>2</sup>

3. "A patentee will not be deemed to have invented species sufficient to constitute the genus by virtue of having disclosed a single species when ... the evidence indicates ordinary artisans could not predict the operability in the invention of any species other than the one disclosed." In re Curtis, 354 F.3d 1347, 1358, 69 USPQ2d 1274, 1282 (Fed. Cir. 2004) (Claims directed to PTFE dental floss with a friction-enhancing coating were not supported by a disclosure of a microcrystalline wax coating where there was no evidence in the disclosure or anywhere else in the record showing applicant conveyed that any other coating was suitable for a PTFE dental floss.) See M.P.E.P §§2163.04, 2163.05.

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<sup>1</sup> See applicant's specification page 1.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 24, 66 and 69 are rejected under 35 U.S.C. 102(e) as being anticipated by Karpman (U.S. 6,441,481).

6. Karpman (Fig. 7,11-15) discloses:

(cl. 24, 66, 69) a method for packaging at least one microscopic device having at least

one moveable region, comprising; forming a housing (20) with at least one aperture

(e.g. not labeled; Fig. 10- 12) over the at least one microscopic device;

placing/depositing a liquid-phase a protective material ("pour", item 50; Col. 4, Lines 50-

55) adjacent to at least a portion of the housing forming a protective layer on housing,

wherein the protective material extends at least partially into t least partially into one

aperture (e.g. encapsulant material reaches substrate, 10) sealing the aperture (Fig. 14)

in amount sufficient to substantially close the aperture without entering the hosing

sufficiently to interfere with the operation of the at least one of the moveable regions

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<sup>2</sup> A microscopic device encompasses every device invisible or indistinguishable without the use of a microscope.

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(e.g. open space surrounding MES, 12 micro/moveable region; ); and allowing or causing the protective layer to harden/cure (Col. 4, Lines 50-55).

7. With respect to the operation of the device, because patents are presumed valid the presumption is also extended to operability of the parts in the patent. See M.P.E.P 716.07,

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-5, 7, 8, 10-12, 24-28, 30-33, 44-48, 50-53, 64 and 66-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sparks et al. (U.S. 5,427,975) in combination with Fuller Jr. et al. (U.S. 5,869,356).

10. Sparks (e.g. Fig. 9a-d; Col. 12, Lines 14-64) discloses:

(cl. 1, 24, 25, 44, 45, 66, 68) a method for packaging at least one microscopic device, comprising: applying a sacrificial material (48) to at least one microscopic device (18); applying a layer of structural material (50) adjacent the sacrificial material, the layer of structural material forming a housing adjacent at least a portion of the sacrificial material (Fig. 9b); creating one or more apertures (52) in the housing of structural material to expose at least a portion of the adjacent sacrificial material;

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removing the sacrificial layer (9b-c), wherein the housing of structural material with at least one aperture remains (9c); depositing a protective material (54) adjacent the housing of structural material overlaying at least one aperture of the housing;

(cl. 2, 64) wherein the method further comprises providing a gas atmosphere, wherein the pressure is greater than or equal to 1 Pascal (Pa); and providing a temperature of less than 600 degrees Celsius (C) (Col.6, Lines 35-57); whereby the overlaying material is in amount sufficient to substantially close the aperture without entering the housing sufficiently to interfere with the operation of the at least one of the moveable regions (e.g. open space surrounding micro/moveable region, 18; ); and allowing or causing the protective layer to harden/cure (Col. 4, Lines 50-55).

(cl. 3, 4, 5, 26, 27, 28, 46, 47, 48) wherein the polyimide, sacrificial material has a higher etch rate than the SiN, structural material (Col. 12, Lines 14-64)<sup>3</sup>;

(cl. 7, 8, 30, 31, 50, 51) removal of sacrificial comprises chemical etch or plasma (Col. 12, Lines 14-64);

(cl. 10, 69) and protective material flows (e.g. material in apertures) into a portion of aperture (Fig. 9d);

(cl. 12, cont. 24, cont. 44) wherein the protective material does not flow into the moveable region (e.g. protective material suspended above sensor, micro device; CLM 18 of Sparks)<sup>4</sup>.

11. Sparks does not appear to explicitly disclose applying the protective material as liquid phase or curing.

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<sup>3</sup> Same material as claimed. See applicant's claims 4 and 5

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12. However, Fuller (Col. 4, Lines 9-18) discloses applying the protective material as liquid phase and curing for an encapsulant.

13. It would have been obvious to one of ordinary skill in the art to form the protective material of Sparks by applying the protective material as liquid phase and curing in order to encapsulate the device as required by Sparks (Col. 12, Lines 58-59)<sup>5</sup>.

14. With respect to the various sized layers in claims 11, 12, 32, 33, 52 and 53 applicant has not disclosed that either the size of his sacrificial or structural layer is for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. As such, the claim that the thickness is for example between .2 microns and 20 microns would have been obvious to one of ordinary skill in the art, since it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

15. With respect to the operation of the device, because patents are presumed valid the presumption is also extended to operability of the parts in the patent. See M.P.E.P 716.07,

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<sup>4</sup> Invention applied to "a wide variety of microstructures

<sup>5</sup> Sparks explicitly discloses in the cited section that its encapsulant may be "any other suitable such as ... an organic material" (hence polymers).

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16. Claims 6, 29 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sparks et al. (U.S. 5,427,975) and Fuller Jr. et al. (U.S. 5,869,356) as applied to claim 1 and 25 and further in combination with Wajnarowski et al. (U.S. 5,366,906).

17. Neither Sparks nor Fuller appears to disclose the step of removing portions of the structural layer by sputter etching or ion beam milling.

18. However, Sparks discloses the same invention except its removal process is by photopatterned instead of for example ion beam milling, Wajnarowski (Col. 6, Lines 41-65) shows that the use of either removal of material by ion beam or photopatterned produces an equivalent structure known in the art. Therefore, because these known processes produce are art recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute a removal process by ion for being photopatterned.

19. Claims 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sparks et al. (U.S. 5,427,975) in combination with Fosberry et al. (U.S. 6,214,640)

20. Sparks discloses the elements stated in paragraph 11 of this office action, but does not appear to explicitly disclose the step of depositing a protective material comprises wicking the protective material into at least one aperture of the housing.

21. Fosberry (Col. 11, Lines 35-40) discloses applying encapsulant material by wicking.

22. It would have been obvious to one of ordinary skill in the art to incorporate a wicking process in order to apply an encapsulant as required by Sparks (item 54, Fig. 9d).



***Response to Arguments***

23. Applicant's arguments with respect to his amended claims have been considered but are moot in view of the new ground(s) of rejection.

24. In order to expedite prosecution examiner has addressed some limitations that may still be relevant.

25. Applicant contends in his reply to the 112 rejection that by disclosing various types of devices that are known in the art that no further elaboration is needed.

Examiner respectfully disagrees, since the issue is not what is known, but whether applicant has support for every species that falls under his claimed microscopic device.

Because the devices disclosed in the specification are MEMS and or micromachined devices, applicant is limited to those species; the claim should be amended by eliminating microscopic and inserting either MEMS and or micro machined device. As previously indicated, there is no support for every species encompassed within the genus microscopic. Because applicant has failed to address the 112 issue consistent with M.P.E.P sections 2163.04 and 2163.05, the rejection is deemed proper.

26. With respect to Karpman, applicant alleges that the claimed invention is patentable over the prior art, because allegedly apertures are not shown over the device. While applicant may want to limit the interpretation of the claim such that the apertures need to be along the same vertical plane as the moveable device as shown in his Figure 4, the claim as currently presented are not so limited. Because the apertures

of Karpman are above the moveable member which is consistent with the plain and ordinary meaning of over, they are encompassed within applicant's broad claim.

27. Lastly, applicant implies that one of ordinary skill in the art would not look to Fuller, because allegedly its encapsulant is difficult to control it teaches away from being used in applying "in an amount...[not] to interfere with operation." Examiner is unpersuaded, Fuller discloses a means for providing an encapsulating layer over a surface by liquid application and cure as claimed by applicant. While the reference does disclose difficulty in controlling the encapsulant, this is the context of applying an encapsulant to a region where some areas are intended to be covered while other areas are excluded (e.g. cover wires but not BGA balls). In contrast, the entire region of Sparks housing will be covered so there is no need for the type of control that was of concern in Fuller.

Applicant has relied on mere conjecture to attempt to establish a teaching away, which is not sufficient to overcome examiner's prima facie case. See M.P.E.P 2145 [R-3]. A disclosure indicating mere difficulty in using/controlling does not alone establish a teaching away from or establish that its unsatisfactory for its Intended Purpose. See M.P.E.P 2145 X.D. cf. In re Grasselli, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir.1983) (The claimed catalyst which contained both iron and an alkali metal was not suggested by the **combination of** a reference which taught the interchangeability of **antimony** and alkali metal with the same beneficial result, combined **with a reference expressly excluding antimony** from, and adding iron to, a catalyst.).[Emphasis added].

Because Sparks discloses encapsulation without providing its specific steps it suggest use of all known encapsulating means. As such, one of ordinary skill in the art in possession of Sparks would be motivated to look at Fuller because it addresses encapsulation.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Mitchell whose telephone number is (571) 272-1931. The examiner can normally be reached on M-F 8:00-4:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ex. Mitchell, J.D.  
April 30, 2007

  
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